

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An engine starting apparatus, comprising:

actuating means;

decompression means for depressing an exhaust valve of the engine via a rocker arm and a lifter of the engine to open the exhaust valve, in correspondence with actuation of said actuating means, the lifter being located between the rocker arm and the exhaust valve and slidably engaged in a lifter housing;

a revolution detecting means for detecting a number of revolutions of a crankshaft of the engine; and

control means for controlling the actuation of said actuating means, said control means starting the actuation of said actuating means in accordance with the actuation of a starter motor of the engine and continuing the actuation of said actuating means until the number of revolutions detected by said revolution detecting means reaches a predetermined number of revolutions.

2. (Currently Amended) The engine starting apparatus according to claim 1, further comprising starting power transmission means for decelerating rotation power of the starter motor and transmitting the power to the crankshaft, said power transmission means being operably mountable between the starter motor and the ~~crankshaft~~; crankshaft.

3. (Original) The engine starting apparatus according to claim 1, wherein said control means is operably connected to an ignition means, said control means controlling the ignition means to start ignition of the engine, in correspondence with stoppage of actuation of said actuating means.

4. (Original) The engine starting apparatus according to claim 2, wherein said control means is operably connected to an ignition means, said control means controlling the ignition means to start ignition of the engine, in correspondence with stoppage of actuation of said actuating means.

5. (Original) The engine starting apparatus according to claim 1, wherein said control means is operably connected to a fuel injection means, said control means controlling the fuel injection means to start fuel injection into the engine, in correspondence with stoppage of actuation of said actuating means.

6. (Original) The engine starting apparatus according to claim 2, wherein said control means is operably connected to a fuel injection means, said control means controlling the fuel injection means to start fuel injection into the engine, in correspondence with stoppage of actuation of said actuating means.

7. (Currently Amended) An engine starting apparatus, comprising:

an actuator;

a decompression device, said decompression device ~~for depressing~~ being operable to depress an exhaust valve of the engine via a rocker arm and a lifter of the engine to open the exhaust valve, in correspondence with actuation of said actuator, the lifter being located between the rocker arm and the exhaust valve and slidably engaged in a lifter housing;

a revolution detector, said revolution detector for detecting a number of revolutions of a crankshaft of the engine; and

a controller, said controller controlling the actuation of said actuator to start actuation in accordance with the actuation of a starter motor of the engine and continue actuation until the number of revolutions detected by said revolution detector reaches a predetermined number of revolutions.

8. (Currently Amended) The engine starting apparatus according to claim 7, further comprising a starting power transmission, said starting power transmission for decelerating rotation power of the starter motor and transmitting the power to the crankshaft, said power transmission being operably mountable between the starter motor and the ~~crankshaft~~; crankshaft.

9. (Original) The engine starting apparatus according to claim 7, wherein said controller is operably connected to an ignition device, said controller controlling the ignition device to start ignition of ignition plugs of the engine, in correspondence with stoppage of actuation of said actuator.

10. (Original) The engine starting apparatus according to claim 8, wherein said controller is operably connected to an ignition device, said controller controlling the ignition device to start ignition of ignition plugs of the engine, in correspondence with stoppage of actuation of said actuator.

11. (Original) The engine starting apparatus according to claim 7, wherein said controller is operably connected to a fuel injection valve, said controller controlling the fuel injection valve to start fuel injection into the engine, in correspondence with stoppage of actuation of said actuator.

12. (Original) The engine starting apparatus according to claim 8, wherein said controller is operably connected to a fuel injection valve, said controller controlling the fuel injection valve to start fuel injection into the engine, in correspondence with stoppage of actuation of said actuator.

13. (Original) The engine starting apparatus according to claim 8, wherein said starting power transmission includes a one-way clutch, said one-way clutch includes a clutch member as one constituent that rotates at a speed higher than that of the crankshaft, said one-way clutch is operably mountable to the crankshaft to be always coupled therewith.

14. (Currently Amended) The engine starting apparatus according to claim 7, wherein said decompression device includes a decompression cam, said decompression cam being operably engageable with an engaging arm of a the rocker arm ~~of the exhaust valve~~, said decompression cam being operably connected to said actuator and rotatable upon actuation of said actuator to open the exhaust valve.

15. (Currently Amended) The engine starting apparatus according to claim 8, wherein said decompression device includes a decompression cam, said decompression cam being operably engageable with an engaging arm of a the rocker arm ~~of the exhaust valve~~, said decompression cam being operably connected to said actuator and rotatable upon actuation of said actuator to open the exhaust valve.

16. (Currently Amended) ~~The~~ An engine starting apparatus according to claim 8, apparatus, comprising:

an actuator;

a decompression device, said decompression device being operable to depress an exhaust valve of the engine to open the exhaust valve, in correspondence with actuation of said actuator;

a revolution detector, said revolution detector for detecting a number of revolutions of a crankshaft of the engine;

a controller, said controller controlling the actuation of said actuator to start actuation in accordance with the actuation of a starter motor of the engine and continue actuation until the number of revolutions detected by said revolution detector reaches a predetermined number of revolutions; and

a starting power transmission, said starting power transmission for decelerating rotation power of the starter motor and transmitting the power to the crankshaft, said power transmission being operably mountable between the starter motor and the crankshaft, wherein said starting power transmission comprises: comprising:

a deceleration gear array for decelerating power from the starter motor;

a one-way clutch;

a damper spring, said damper spring being mounted between said deceleration gear array and an inner member of said one-way clutch;

a flywheel, said flywheel being fastened to an outer member of said one-way clutch;

a rotary shaft coaxially connected to said flywheel; and
a gear, said gear being mounted on said rotary shaft and operably connectable to the crankshaft,
wherein said clutch inner member transmits power from said deceleration gear array to said clutch outer member when the number of revolutions of the clutch inner member is greater than the number of revolutions of the clutch outer member.

17. (Original) The engine starting apparatus according to claim 16, wherein said deceleration gear array comprises:

a support shaft; and
a first gear, said gear including a cylindrical shaft rotatably supported by said support shaft, said first gear being operably connected to said clutch inner member;
a second gear, said second gear being mounted for rotation with said first gear by being press-inserted on an outside of said cylindrical shaft, said second gear being operably connectable with a gear of the starter.

18. (New) The engine starting apparatus according to claim 7, wherein said decompression device is a cam.

19. (New) The engine starting apparatus according to claim 7, wherein said decompression device is an exhaust valve decompression device and said actuator is connected to only said exhaust valve decompression device.

20. (New) An engine starting apparatus, comprising:
a decompression cam, said decompression cam being operable to depress an exhaust valve of the engine to open the exhaust valve;
an actuator, said actuator being operable to actuate said decompression cam;
a revolution detector, said revolution detector for detecting a number of revolutions of a crankshaft of the engine; and
a controller, said controller controlling the actuation of said actuator to start actuation in accordance with the actuation of a starter motor of the engine and continue actuation until the number of revolutions detected by said revolution detector reaches a predetermined number of revolutions.

21. (New) The engine starting apparatus according to claim 20, further comprising a starting power transmission, said starting power transmission for decelerating rotation power of the starter motor and transmitting the power to the crankshaft, said power transmission being operably mountable between the starter motor and the crankshaft.

22. (New) The engine starting apparatus according to claim 20, wherein said controller is operably connected to an ignition device, said controller controlling the ignition device to start ignition of ignition plugs of the engine, in correspondence with stoppage of actuation of said actuator.

23. (New) The engine starting apparatus according to claim 20, wherein said controller is operably connected to a fuel injection valve, said controller controlling the fuel injection valve to start fuel injection into the engine, in correspondence with stoppage of actuation of said actuator.

24. (New) The engine starting apparatus according to claim 21, wherein said starting power transmission includes a one-way clutch, said one-way clutch includes a clutch member as one constituent that rotates at a speed higher than that of the crankshaft, said one-way clutch is operably mountable to the crankshaft to be always coupled therewith.

25. (New) The engine starting apparatus according to claim 20, wherein said decompression cam is operably engageable with an engaging arm of a rocker arm of the engine, said decompression cam being operably connected to said actuator and rotatable upon actuation of said actuator to open the exhaust valve.

26. (New) The engine starting apparatus according to claim 20, wherein said decompression cam is an exhaust valve decompression cam and said actuator is connected to only said exhaust valve decompression cam.